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# PATENT SPECIFICATION



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194,419

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Complete Accepted: March 15, 1923.

## PROVISIONAL SPECIFICATION.

### Improvements connected with the Marking and Identifying of Conductors of Electric Cables, and similar purposes.

I, ERNEST THOMAS WILLIAMS, of 11, The Drive, Golders Green, in the County of London, Electrical Engineer, British subject, do hereby declare the nature of this invention to be as follows:—

This invention has reference to the marking and identification of conductors or wires of either single or multi-conductor or single or multi-core cables.

10 It is well known that the conductors or cores of multi-conductor electric cables have for the purpose of identification in testing through for connecting them up to the various instruments and junction

15 boxes been provided with distinctive markings; and in the manufacture of these cores or cables, many modes of marking them have been proposed. In comparatively recent years one of the

20 kinds of marking has been that the cores had their di-electric coloured, by covering them with different coloured tapes of a single colour, or multiple colours, as is wellknown; whilst according to other and

25 later systems, the marking for identifying purposes has consisted in applying a tape, proofed on the underside, and white in colour on the outside, to the conductors or cores, say by wrapping them helically

30 round same, and furnishing on the white outside surface of the tape with black or coloured numerals, printed at intervals and arranged to come on opposite sides of the conductors.

35 The object of this latter modification or method was to get over a defect of the former method of identification, namely that in using these cables, the coloured conductors or cores became so defaced

40 that it was very difficult to trace the different colours in attempting to identify the different conductors or cores; but in practice, it was found that this method was little, if any, better than the former

one; and the same objections exist in connection with it, as in connection with the former.

In addition to these attempts to provide a satisfactory system of marking and identification, by which mistakes could be avoided, and the use rendered easy, further proposals have been made; one of which is the weaving of numbers in the tape, and another is printing the tape before applying it to the core with the numerals on the underside; and there have been other methods proposed, but none of them have been proved satisfactory, and if impregnated paper insulation is used instead of rubber, the problem is rendered still more difficult, because of the dark or black colour of the impregnation used.

The object then of the present invention is to provide a marking or identifying method in connection with the conductors by which they may be surely and easily found or recognised, in spite of the conductors or di-electric becoming dirty or covered with obliterating substances in the use of cables as referred to; and according to this invention, this end is accomplished by a wrapping or covering on the conductors or dielectric of a strip or strips of thin metal tape, such as tin-foil, or aluminium, copper, or other suitable metal, having upon it embossed, impressed, or like mechanical identifying markings or signs, or perforations, and these markings or signs may be numerals, letters, or other devices.

The metal tapes may be wound round the di-electric of the cores as a helix, and the markings or signs are provided on or in it at such a distance apart that in the convolutions, they may appear to be in a line parallel with the conductor or core in any small length, that has to be exposed; and when the signs are in the

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form of mechanical markings, letters or numerals or the like, these may be impressed or furnished on or in the metal tapes at such an angle, that when wound helically on the di-electric, the marking may come in position and line as required.

The metal tapes may be placed so that a space comes between the convolutions, or they may completely cover the di-electric as may be desired to meet different conditions or requirements.

In the preparation and manufacture of the metal tapes, a sheet of the metal may be cut up into multiple tapes or ribbons, and furnished with the signs, symbols or markings by embossing, perforating or the like, in the one operation, by slitting it in a rotary knife slitting machine, the sign, symbols or markings being furnished by rotary or suitable dies, punches or the like, so arranged and adapted as to produce the alignment effect of the signs or markings above referred to.

By the improved marking or identifying

means in conductors or cores of cables of the kind referred to, the difficulties and defects above referred to hitherto existing, are overcome or avoided; and in the use of this invention in connection with conductors with paper di-electric impregnated with the compound, when such compound gets on to the surface of the metal, or any dirt obscures the markings or signs, it can be easily wiped off the metal covering or wrapping by the operator, and the signs or markings, when embossed or otherwise, can be easily seen, and will show up dark on the bright metal.

Whilst the invention has been applied more particularly to electrical cables, it may also be applied to or in connection with other manufactures, in connection with which its employment would be advantageous.

Dated this 14th day of December, 1921.

E. R. ROYSTON & Co.,

Applicant's Patent Agents,  
Tower Building, Water Street, Liverpool.

#### COMPLETE SPECIFICATION.

#### Improvements connected with the Marking and Identifying of Conductors of Electric Cables, and similar purposes.

I, ERNEST THOMAS WILLIAMS, of 11, The Drive, Golders Green, in the County of London, Electrical Engineer, British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to the marking and identification of conductors or wires of or for single multi-conductor or single cables.

It is wellknown that the conductors or cores of electric cables have for the purpose of identification in testing through, for connecting them up to the various instruments and junction boxes, been provided with distinctive markings; and in the manufacture of these cores or cables, many modes of marking them have been proposed. In comparatively recent years one of the kinds of marking has been that the wires or cores had their di-electric coloured, by covering them with different coloured tapes of a single colour, or multiple colours, as is wellknown; whilst according to other and later systems, the marking for identifying purposes has consisted in applying a tape, proofed on the underside, and white in colour on the outside, to the conductors or cores, say by wrapping them helically round same,

and furnishing on the white outside surface of the tape with black or coloured numerals, printed at intervals, and arranged to come on opposite sides of the conductors.

The object of this latter modification or method was to get over a defect of the former method of identification, namely, that in using these cables, the coloured conductors or cores became so defaced that it was very difficult to trace the different colours in attempting to identify the different conductors or cores; but in practice, it was found that this method was little, if any, better than the former one; and the same objections exist in connection with it, as in connection with the former.

In addition to these attempts to provide a satisfactory system of marking and identification, by which mistakes could be avoided, and the use rendered easy, further proposals have been made; one of which is the weaving of numbers in the tape, and another is printing the tape before applying it to the core with the numerals on the underside; and there have been other methods proposed, but none of them have been proved satisfactory, and if oil or compound impregnated paper insulation is used instead of rubber, the problem is rendered still more

difficult, because of the dark or black colour of the impregnating medium used.

In other cases it has been proposed to use a narrow metallic tape of metal, impressed at intervals with the particular information desired, over a first steel armour tape, the information tape being placed in a spiral space between the convolutions of a second steel armouring outside the first.

The object then of the present invention is to provide a marking or identifying method in connection with the conductors by which they may be surely and easily found or recognised, in spite of the conductors or di-electric becoming dirty or covered with obliterating substances in the use of cables as referred to; and according to this invention, this end is accomplished by directly wrapping or covering the di-electric with a strip or strips of thin metal tape, such as tinfoil, or aluminium, copper, or other suitable metal, having upon it embossed, impressed, or like mechanical identifying markings or signs, or perforations; and these markings or signs may be numerals, letters, or other devices, or combinations of same.

The metal tapes may be wound round the di-electric of the cores as a helix, and the markings or signs are provided on or in it at such a distance apart that in the convolutions, they may appear to be in a line parallel with the conductor or core in any small length, that has to be exposed; and when the signs are in the form of mechanical markings, letters or numerals or the like, these may be impressed or furnished on or in the metal tapes at such an angle, that when wound helically on the di-electric, the marking may come in position and line as required.

The metal tapes may be placed so that a space comes between the convolutions, or they may completely cover the di-electric as may be desired to meet different conditions or requirements.

In the preparation and manufacture of the metal tapes, a sheet of the metal may be cut up into multiple tapes or ribbons, and furnished with the signs, symbols or markings by embossing, perforating, or the like, in the one operation, by slitting it in a rotary knife slitting machine, the signs, symbols or markings being furnished by rotary or suitable dies, punches or the like, so arranged and adapted as to produce the alignment effect of the signs or markings above referred to.

By the improved marking or identifying means in conductors or cores of cables of the kind referred to, the difficulties and defects above referred to hitherto existing, are overcome or avoided; and in the

use of this invention in connection with conductors with paper di-electric impregnated with a liquid compound, when such compound gets on to the surface of the metal or any dirt obscures the markings or signs, it can be easily wiped off the metal covering or wrapping by the operator, and the signs or markings, when impressed or embossed or otherwise can be easily seen, and will show up dark on the bright metal.

An example of cable conductor under this invention is illustrated in the annexed drawings.

Figure 1 is a side elevation of the conductor under the invention, and Figure 2 is a section of same.

Figures 3, 4 and 5 give examples of markings in which numerals and letters are employed.

In the case shown in Figures 1 and 2, the metal strips or ribbons *a* may be assumed to be thin, such as metal foil, and of tin, aluminium, copper, or other suitable metal, and the identifying numerals are impressed into the metal, and may be assumed to be in black or coloured type, or otherwise as desired.

The identifying numerals or symbols are in the case shown, impressed at such an angle, and at such distances apart on the metal ribbon or strip that when wound helically round the di-electric *b* of the wire *c*, they come in an upright position and in lines as shown, which is advantageous. Further, in the case shown, the symbols are embossed or impressed in the strip *a* at such a distance apart, that in one convolution of the tape or ribbon, one symbol will come on one side, and another on the other, so that the identifying markings can be seen from either side of the conductor.

In the examples shown in Figures 3, 4 and 5, which show identifying symbol markings, these markings consist of a numeral, and the first letter of the work specifying such numeral.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. An electric conductor or wire of or for cables having identifying symbols or markings, consisting of a strip or ribbon of metal, or a plurality of same, helically wound directly upon the di-electric of the conductor or wire, and having in it embossed, impressed or like mechanical identifying markings or signs, or perforations; substantially as and for the purpose specified.

2. An electric conductor or wire of or for cables, having a strip or ribbon of

metal, or a plurality of same, round the di-electric of the conductor or wire, embossed, impressed or like mechanical identifying markings or signs, or perforations, arranged to come in line, substantially as set forth.

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3. A conductor or wire of or for an

electric cable, substantially as herein described with reference to Figures 1 and 2 of the drawings.

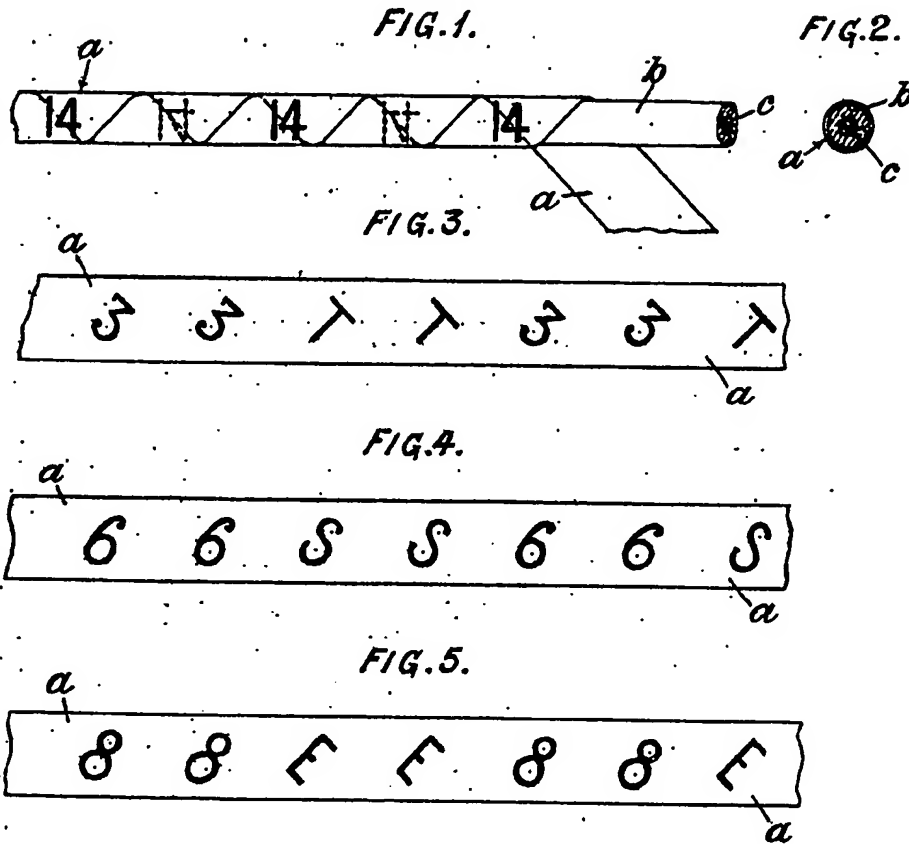
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Dated this 13th day of September, 1922.

E. R. ROYSTON & Co.,  
Applicant's Patent Agents,  
Tower Building, Water Street, Liverpool.

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[This Drawing is a reproduction of the Original on a reduced scale.]



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